

IN THE CLAIMS:

Claims 1 and 4 have been amended herein. All of the pending claims 1 through 9 are presented below. This listing of claims will replace all prior versions and listings of claims in the application. Please enter these claims as amended.

Listing of Claims:

1. (Currently Amended) A liquid solder jet apparatus for depositing a stream of liquid solder droplets on selected bond pads of at least one semiconductor die of a substrate having a surface having a plurality of locations of contact pads thereon extending throughout the surface, each location of the plurality of locations on the surface having a start point and an endpoint, comprising:
a continuous stream generator for producing a stream of liquid metal solder droplets, the liquid metal solder droplets having a uniform size within a consistent predetermined range, the consistent predetermined range of uniform size metal solder droplets being within a size of the selected bond pads of the at least one of the semiconductor die and the contact pads of the substrate;
a stream director for selectively directing the stream of liquid metal solder droplets after being produced by the continuous stream generator onto the selected bond pads of the at least one semiconductor die of the substrate, the stream director comprising a raster scanner scanning the stream of liquid metal solder droplets, the raster scanner including:
an electrical charge generator for charging at least a portion of the liquid metal solder droplets of the stream of liquid metal solder droplets with an electrical charge;
a stream blanking device for intermittently blanking at least some of the liquid metal solder droplets of the stream of liquid metal solder droplets; and

an electrically charged droplet deflector for deflecting at least one electrically charged liquid metal solder droplet of the stream of liquid metal solder droplets in a first direction and a second direction for deposition at a location of the plurality of locations extending throughout the surface of the substrate when the substrate remains stationary;

a reservoir for holding liquid metal solder;

a vibrator for causing formation of the stream of liquid metal solder droplets; and

a temperature controller connected to the reservoir for maintaining the liquid metal solder in a liquid state.

2. (Previously Presented) The apparatus according to claim 1, wherein the continuous stream generator comprises:

a pressure inducer; and

the vibrator comprises a vibrator connected to the pressure inducer for causing formation of the stream of liquid metal solder droplets in connection with the pressure inducer.

3. (Previously Presented) The apparatus according to claim 2, wherein the pressure inducer comprises a piezoelectric crystal operating at a desired frequency.

4. (Currently Amended) The apparatus according to claim 2, wherein the vibrator comprises a piezoelectric crystal operating at a selected frequency to form liquid metal droplets having a size in the range a range of micron size droplets of a liquid metal solder.

5. (Previously Presented) The apparatus according to claim 1, wherein the continuous stream generator includes a solder jet nozzle having an aperture producing a consistent range of droplets of the liquid metal solder for forming the stream of liquid metal solder droplets.

6. (Previously Presented) The apparatus according to claim 5, wherein the continuous stream generator further includes a solenoid connected to the solder jet nozzle.

7. (Previously Presented) The apparatus according to claim 1, wherein the stream blanking device at least provides blanking of the at least some of the stream of liquid metal solder droplets when the stream of liquid metal solder droplets is positioned between the endpoint of a first location of the plurality of locations extending throughout the surface of the substrate and the start point of a second location of the plurality of locations extending throughout the surface of the substrate.

8. (Previously Presented) The apparatus according to claim 1, wherein the stream blanking device comprises:

a deflector field device selectively deflecting at least one droplet of the stream of liquid metal solder droplets; and

a droplet catcher catching the at least one droplet which has been deflected from the stream of liquid metal solder droplets prior to the at least one droplet which has been deflected from the stream of liquid solder droplets being deposited on at least one bond pad of the at least one semiconductor die of the substrate.

9. (Previously Presented) The apparatus according to claim 1, wherein the stream director includes a programmable direction controller for determining a direction of the stream of liquid metal solder droplets.